

# INTRODUCTION

The Installation - Operation - Maintenance Instructions contained in this manual are based on engineering data, field tests and to a large extent, on many years of Harvestore owner experiences. They are intended as guide lines for your operation.

Each farm varies to some degree in the type of crop grown, soil fertilization, harvesting and feeding practices.

Each owner applies management techniques which are consistent with his experience and geographic area. You may find that because of all the differing factors involved, your individual circumstances will dictate a variation from procedures detailed in this manual.

If you have any questions or recommendations on procedures not covered in this manual, please contact your Harvestore Dealer.

May we take this opportunity to thank you for purchasing our product.

## **WARNING !!**

**UNLOADERS ARE POWERFUL MACHINES. FAILURE TO FOLLOW THESE INSTRUCTIVE GUIDELINES MAY CAUSE DAMAGE TO THE UNLOADER OR INJURY TO THE PERSONS ENGAGED IN THE PROCEDURES. READ THE TEXT CAREFULLY BEFORE ATTEMPTING ANY OF THESE OPERATIONS. AND FOLLOW THEM FAITHFULLY.**

## TABLE OF CONTENTS

	PAGE
SAFETY GUIDELINES TO HARVESTORE OPERATION .....	Reverse side 74-01.0
TO UNLOAD FORAGES .....	Reverse side 74-02.0
Forage Cutter Hook Sequence Chart .....	74-03.0
TO UNLOAD SEMI-FREE FLOWING MATERIALS .....	Reverse side 74-03.0
Semi-Free Flowing Cutter Hook Sequence Chart .....	74-04.0
Unloader Hood Adjustment .....	Reverse side 74-04.0
TO UNLOAD FREE FLOWING MATERIALS .....	74-05.0
Grain Cutter Hook Sequence Chart .....	Reverse side 74-05.0
Unloader Hood Adjustment .....	74-06.0
Unloading High Moisture Barley and Wheat .....	Reverse side 74-06.0
SHORTENING THE CUTTER ARM .....	74-07.0
PREPARING STRUCTURE AND POSITIONING UNLOADER .....	Reverse side 74-08.0
DRIVING AND HOLDING PAWL OPERATION .....	Reverse side 74-09.0
REVERSING ARM MECHANISM ADJUSTMENT .....	74-10.0
INSTALLING THE UNLOADER .....	74-11.0
UNLOADER OPERATION .....	74-13.0
PREVENTIVE MAINTENANCE GUIDES .....	74-14.0
BOLT TORQUE .....	74-16.0
PRESSURE SENSITIVE LUBRICATION SCHEDULE	

# SAFETY GUIDELINES TO HARVESTORE OPERATION

Being safety conscious is a part of good management, as with any piece of mechanized equipment common sense rules of operation and maintenance need to be observed. Incorrect use of equipment is usually a greater hazard than the equipment itself. This check list has been prepared for you to post in your feedroom as a regular reminder to those working around the structure.

1. **DANGER: STAY OUT OF THE FILLED OR PARTIALLY FILLED HARVESTORE. NOT ENOUGH OXYGEN TO SUPPORT LIFE.**

Respiration and fermentation of the material in a Harvestore converts oxygen in the air into carbon dioxide. In less than half an hour after forage or high moisture grain is put into a Harvestore, the oxygen content of the air within the structure may be too low for a person to live.

If tools or other objects are accidentally dropped into the structure, don't attempt to retrieve them yourself. Call your Harvestore dealer; his servicemen are equipped with oxygen apparatus to safely enter the structure.

If anyone needs to enter a structure he must use oxygen equipment, be roped to an outside fixture, and be constantly observed and attended by someone outside the access opening.

**WARNING: NEVER ENTER A HARVESTORE STRUCTURE WHICH CONTAINS MORE GRAIN OR SILAGE THAN THAT WHICH IS LEFT AFTER THE UNLOADER HAS REMOVED ALL THAT IT CAN.**

If you enter the structure to clean out residual material left after unloader operation is completed, open the filler doors in the roof and the structure access door and ventilate the structure with a pressure blower.

**DANGER: NEVER OPERATE THE UNLOADER WHILE ANY PERSON(S) ARE INSIDE THE STRUCTURE. SERIOUS PERSONAL INJURY MAY RESULT.**

The recommended length of time for ventilating will depend upon the size of the structure and the capacity of the blower. For example, if the structure is a 2027 unit, and the blower capacity is 1,000 CFM, operate it for 15 minutes before entering. If the structure is a 2580 Harvestore, ventilate for an hour with a 1,000 CFM blower.

2. Ventilate the feed room while the unloader is in operation. If feed room is very tight, carbon dioxide can build up when the unloader discharge door is open.
3. Turn the main switch off during periods when the unloader is not in use or when performing service.
4. **DANGER: DISCONNECT MAIN POWER SOURCE WHEN MAKING ANY ADJUSTMENTS ON UNLOADER.**
5. Never operate the unloader without the belt guard in place.
6. Do not leave the unloader unattended while it is in operation.
7. **DANGER: UNDER NO CIRCUMSTANCES SHOULD YOU REMOVE THE QUICK ACCESS DOOR (ALUMINUM CAST DOOR) IMMEDIATELY ABOVE UNLOADER AND SECURED WITH 4 CLAMP SCREWS OR METAL PLATE BOLTED TO DOOR FRAME) WITHOUT FIRST DISCONNECTING THE MAIN POWER SOURCE TO THE UNLOADER. SERIOUS PERSONAL INJURY MAY RESULT.**

8. Clean the motor occasionally - avoid build up of dust and grime. Observe usual safety precautions for electrical motors.

9. If the unloader discharges into an auger, a chute must be installed between the unloader and auger (available from Harvestore Products, Inc. as an accessory) a shield must be installed over all other sections of the auger to prevent accidents, etc.

10. Never leave a ladder where it can be used by children to climb a Harvestore.

11. Install a roof guard rail assembly for protection while working on top of structure.

12. Secure any tools or equipment left on top of the structure.

13. Keep away from the structure during electrical storms.

14. Keep all access door openings closed daily, after filling the structure.

15. Follow good housekeeping practices. Junk and debris can conceal danger and could result in personal injury.

16. We strongly recommend the use of the "UNLOADER INSTALLATION PULLER FRAME ASSEMBLY" when installing the Unloader into structure.

- UNDER NO CIRCUMSTANCES is anyone to stand between the Support Rails at ANY TIME when installing or removing the Unloader.

- UNDER NO CIRCUMSTANCES is anyone to stand on either side of the exposed chains during installation or removal of Unloader from structure.

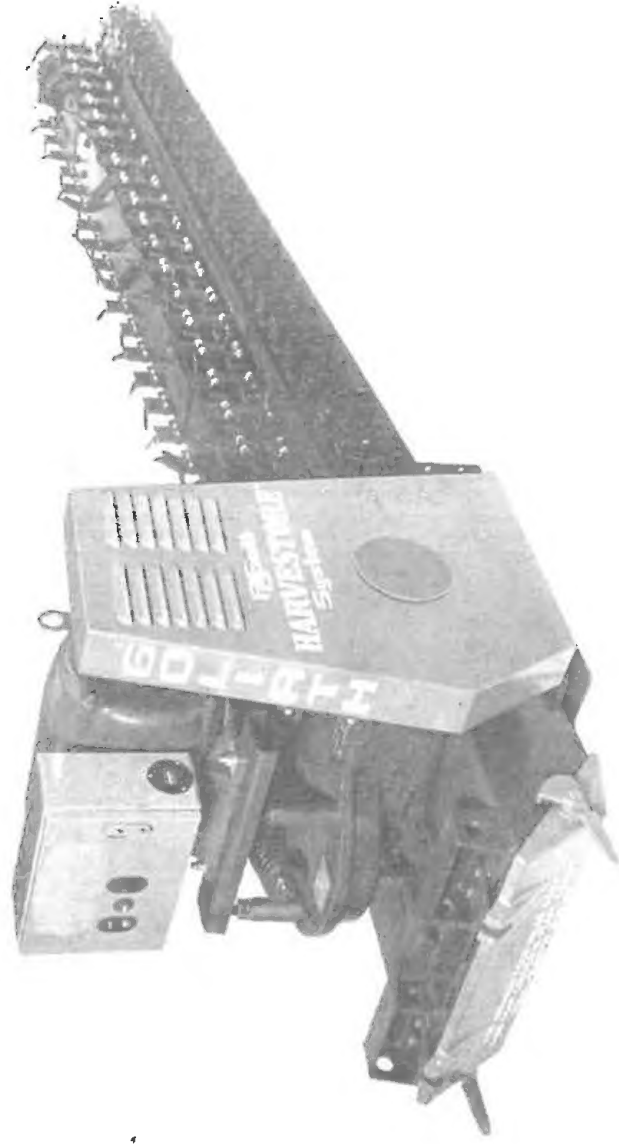
- Failure to observe safety rules on installation and removal of unloader could result in serious injury.

17. If your structure(s) is equipped with an external breather bag system;

CAUTION: External breather bags contain carbon dioxide gas (CO<sub>2</sub>). All feedrooms, machine sheds, and all other enclosures that contain external breather bags must be adequately ventilated.

## TO UNLOAD FORAGES:

Here is the Goliath chain-type, sweep-arm bottom unloader. The unloader is shown ready for installation in a Harvestore. The Harvestore is filled before the unloader is installed when used for forages.



The Goliath unloader has a two-speed trapmission.

The cutter hooks and chain mounted on the sweep-arm draw forage to the center of the Harvestore. Then the conveyor chain moves the material out of the structure through the unloader door.

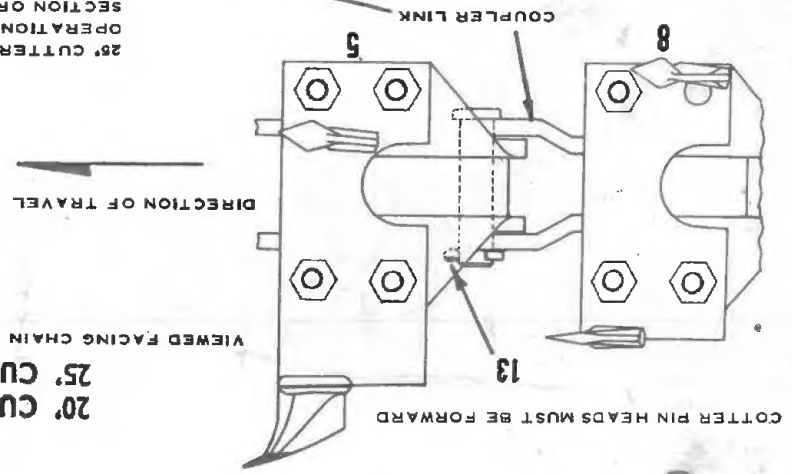
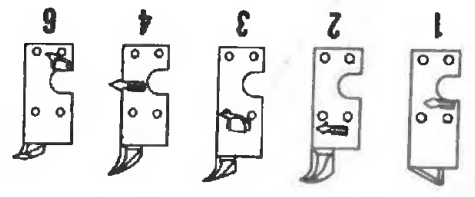
In forages, 3 to 5 revolutions of the shortened cutter arm should be made to establish bridge. Refer to "Unloader Operation" section of this manual.

The normal forward rotation of the sweep-arm is counterclockwise although it can be rotated in the opposite direction.

Forage cutter hooks and knives must be attached to the cutter arm chain in the correct sequence. Refer to the forage cutter hook sequence chart.

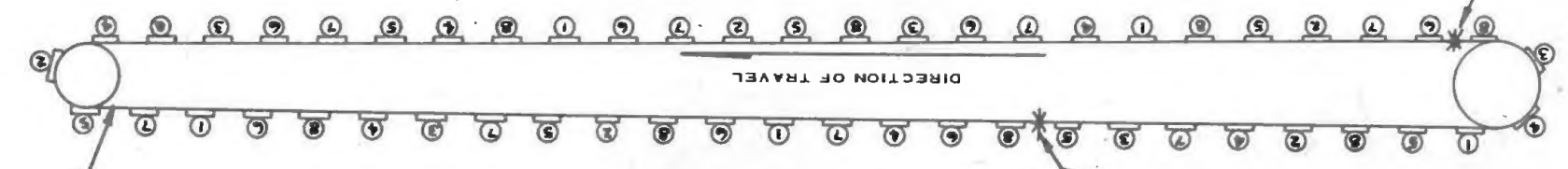
# FORAGE

20' CUTTER CHAIN & HOOK ASSEMBLY - PART NO. 81080-1  
 25' CUTTER CHAIN & HOOK ASSEMBLY - PART NO. 81080-0



25' CUTTER HOOK SEQUENCE FOR SHORT ARM  
 OPERATION REMOVE 10 LINK SECTION, 23 LINK  
 SECTION OR 33 LINK SECTION.

108 LINKS FOR 25' UNLOADER  
 (INCLUDES 2 COUPLER LINKS)

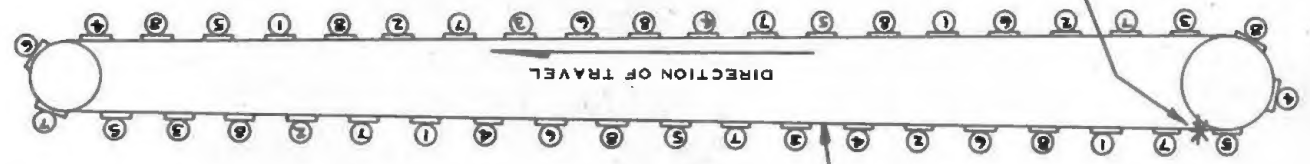


COUPLER LINK

9

20' CUTTER HOOK SEQUENCE FOR SHORT ARM  
 OPERATION REMOVE A 10 LINK SECTION.

85 LINKS FOR 20' UNLOADER  
 (INCLUDES ONE COUPLER LINK)



COUPLER LINK

11, 12

TIGHTEN NUTS TO 55-60 FT. LBS.  
 NUTS MUST BE ON THIS SIDE.

DIRECTION OF TRAVEL

VIEWED FACING CHAIN

ITEM	DESCRIPTION	QUANTITY	20' SE.	25' SE.	PART NO.
1	CUTTER HOOK & KNIFE ASSY.	4			81081-1
2	CUTTER HOOK ASSY.	4			81082-1
3	CUTTER HOOK ASSY.	4			81083-1
4	CUTTER HOOK ASSY.	4			81084-1
5	CUTTER HOOK ASSY.	4			81085-1
6	CUTTER HOOK ASSY.	4			81086-1
7	CUTTER HOOK ASSY.	4			81087-1
8	CUTTER HOOK ASSY.	4			81088-1
9	CUTTER HOOK ASSY.	4			81089-0
10	CUTTER CHAIN	1			80895-0
11	CUTTER CHAIN	1			80895-0
12	HEX NUT	195			13543-30
13	COTTER PIN	195			17500-65

ITEM	DESCRIPTION	QUANTITY	20' SE.	25' SE.	PART NO.
1	CUTTER HOOK & KNIFE ASSY.	4			81081-1
2	CUTTER HOOK ASSY.	4			81082-1
3	CUTTER HOOK ASSY.	4			81083-1
4	CUTTER HOOK ASSY.	4			81084-1
5	CUTTER HOOK ASSY.	4			81085-1
6	CUTTER HOOK ASSY.	4			81086-1
7	CUTTER HOOK ASSY.	4			81087-1
8	CUTTER HOOK ASSY.	4			81088-1
9	CUTTER HOOK ASSY.	4			81089-0
10	CUTTER CHAIN	1			80895-0
11	CUTTER CHAIN	1			80895-0
12	HEX NUT	195			13543-30
13	COTTER PIN	195			17500-65

## TO UNLOAD SEMI-FREE FLOWING MATERIALS:

This unloader is different because it has a cover around the center post called a "hood". The hood consists of support guides, slides and an extension plate.



The slides and extension are used to regulate the flow of material. It is recommended that the hooded unloader be placed into the structure before filling. Unloader hold down angles (attached to slides of trough) must be unbolted and removed.

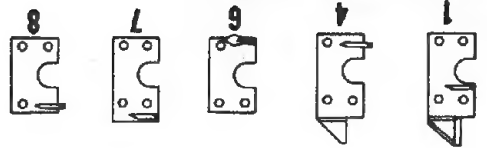
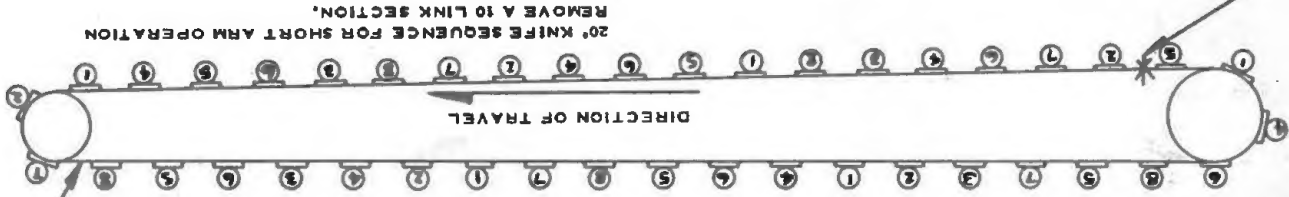
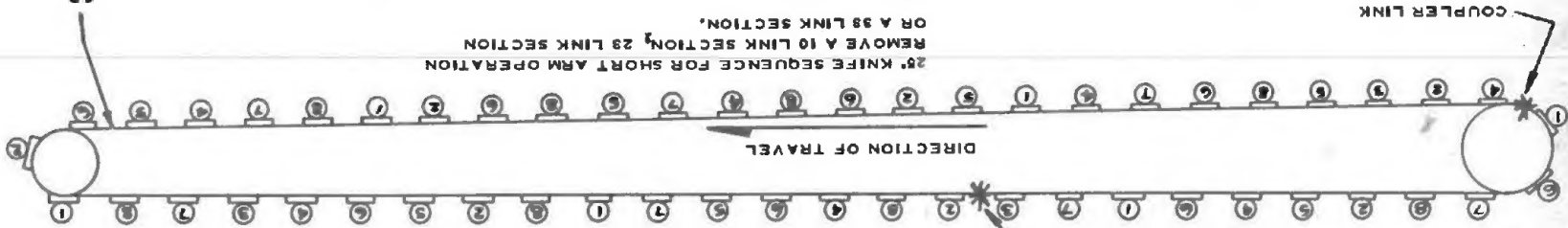
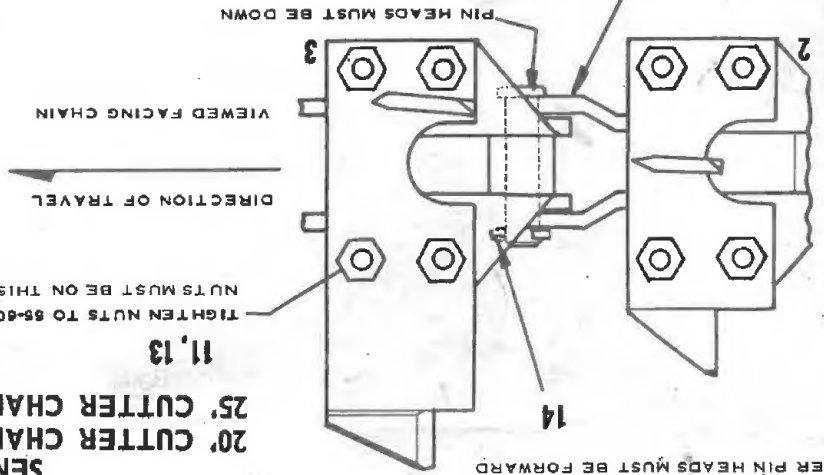
Remove the longest insert from the cutter arm and a 23 link chain section from the cutter chain on a 25' unloader. (On the 20' Goliath Unloader, remove the arm insert and a 10 link chain section). The cutter arm is kept moving continually with the compression springs on the ratchet drive arm set at "low" compression.

The hooded style Goliath unloader is intended for ground ear corn, ground sorghum heads or similar ground material which doesn't readily flow by gravity to the bottom of the structure. Such material is termed "semi-free flowing" in this manual.

The semi-free cutter hooks and knives must be attached to the cutter arm chain in the correct sequence. Refer to the semi-free flowing cutter hook sequence chart.

# SEMI-FREE FLOWING MATERIAL 20' CUTTER CHAIN & KNIFE ASSEMBLY - PART NO. 81413-0 25' CUTTER CHAIN & KNIFE ASSEMBLY - PART NO. 81413-1

ITEM	DESCRIPTION	20' SE- QUANCE	25' SE- QUANCE	PART NO.
1	CUTTER KNIFE ASSEMBLY	5	6	81466-1
2	CUTTER KNIFE ASSEMBLY	4	7	81467-1
3	CUTTER KNIFE ASSEMBLY	4	7	81468-1
4	CUTTER KNIFE ASSEMBLY	6	7	81469-1
5	CUTTER KNIFE ASSEMBLY	6	7	81471-1
6	CUTTER KNIFE ASSEMBLY	8	8	81472-1
7	CUTTER KNIFE ASSEMBLY	5	7	81473-1
8	CUTTER KNIFE ASSEMBLY	5	7	81480-1
9	CUTTER CHAIN	1	-	80895-0
10	CUTTER CHAIN	1	-	80895-1
11	CAP SCREW, HEX HD.	16	16	17500-65
12	CAP SCREW, HEX HD.	174	174	17500-71
13	HEX NUT	185	185	13543-30
14	COTTER PIN	151	151	13696-15



ON CUTTER KNIFE ASSEMBLY NO. 81468-1, ITEM NO. 3  
USE CAP SCREW 17500-65 ONLY. ALL OTHER CUTTER  
KNIVES USE 17500-71.

COTTER PIN HEADS MUST BE FORWARD

TIGHTEN NUTS TO 55-60 FT. LBS.  
NUTS MUST BE ON THIS SIDE

PIN HEADS MUST BE DOWN

25' KNIFE SEQUENCE FOR SHORT ARM OPERATION  
REMOVE A 10 LINK SECTION, 25 LINK SECTION  
OR A 38 LINK SECTION.

20' KNIFE SEQUENCE FOR SHORT ARM OPERATION  
REMOVE A 10 LINK SECTION.

COUPLER LINK

COUPLER LINK

COUPLER LINK

12, 13

11, 13

14



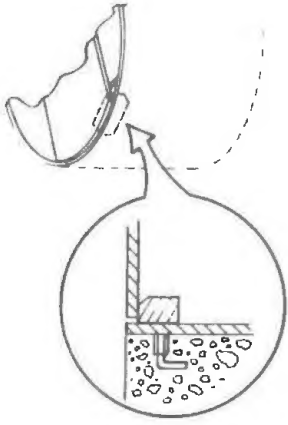
## UNLOADER HOOD ADJUSTMENT

### 1. Using the extension plate:

- Leave extension plate on if material is ground fine and moisture content is 25% or less.



- The extension plate must rest on top of the extension plate support when the unloader is placed into the structure.



- Remove extension plate when moisture content of material is over 25%. Take out bolts to remove plate from hood.



### 2. The slides are adjusted through openings in the unloader housing using the lever provided with the hooded unloader. Disconnect unloader power supply when adjusting slides.

- Remove the cap over the adjusting rod of the slide to be adjusted. Insert the lever into an opening in the rod.
- Slide is closed when moved all the way forward. Do not operate unloader in semi-free flowing material with extension plate installed and left side slide closed as this will block material flow to conveyor chain.



TO OPEN SLIDE

TO CLOSE SLIDE

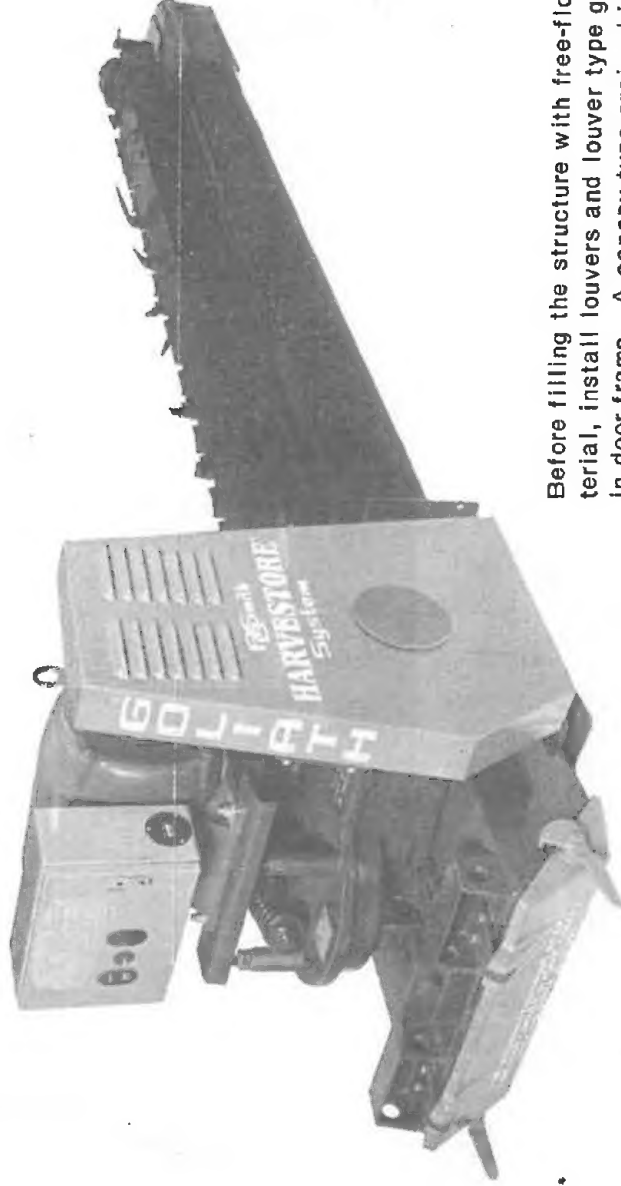
- Left slide (as viewed facing outside of door frame) can be adjusted with the extension plate in place or removed.



- Right slide can be adjusted only if the extension plate has been removed.
- Coat threads in pipe cap with approved sealer and replace cap.



## TO UNLOAD FREE FLOWING MATERIALS:



### THE GOLIATH UNLOADER WITH HOOD IS USED TO UNLOAD FREE FLOWING MATERIALS.

This unloader consists of the same basic unit as the chain type unloader used for semi-free flowing material. The unloader is installed before the structure is filled. This unloader, with the hood fully assembled can be used to unload high moisture shelled corn, sorghum grain or any other small grain which flows by gravity to the bottom of the structure. Such material is referred to as free-flowing material in this manual. The hood is used to regulate the flow of material. Unloader hold down angles (attached to sides of trough) must be unbolted and removed.

A shortened Cutter Arm and Cutter Chain is used for unloading free-flowing material.

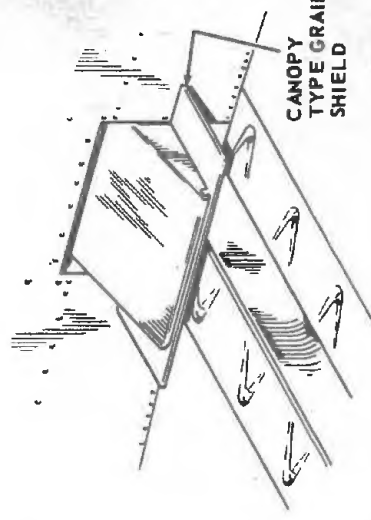
When unloading free-flowing materials, remove the Insert on 20' Cutter Arms, remove both Inserts on 25' Cutter Arms, and shorten the Cutter Chains respectively. The Cutter Arm is then kept moving all the time with Compression Springs at lowest possible setting, until the angle of repose is reached and no, or very little, material is being delivered. The Cutter Arm is then brought to the six-o'clock position (over the Backbone), the Ratchet Wheel is pinned in this position, and the unloader is removed from the structure.

Install the Insert Section(s) removed above and the section of Cutter Chain to the Cutter Arm. Re-install the unloader into the structure for cleanout.

Before filling the structure with free-flowing material, install louvers and louver type grain shield in door frame. A canopy type grain shield for 24" and 30" wide door frames is available as optional equipment.



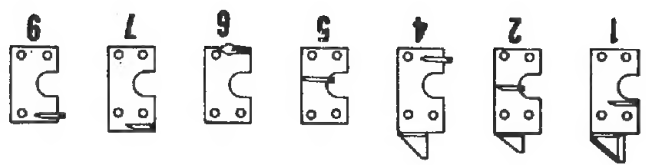
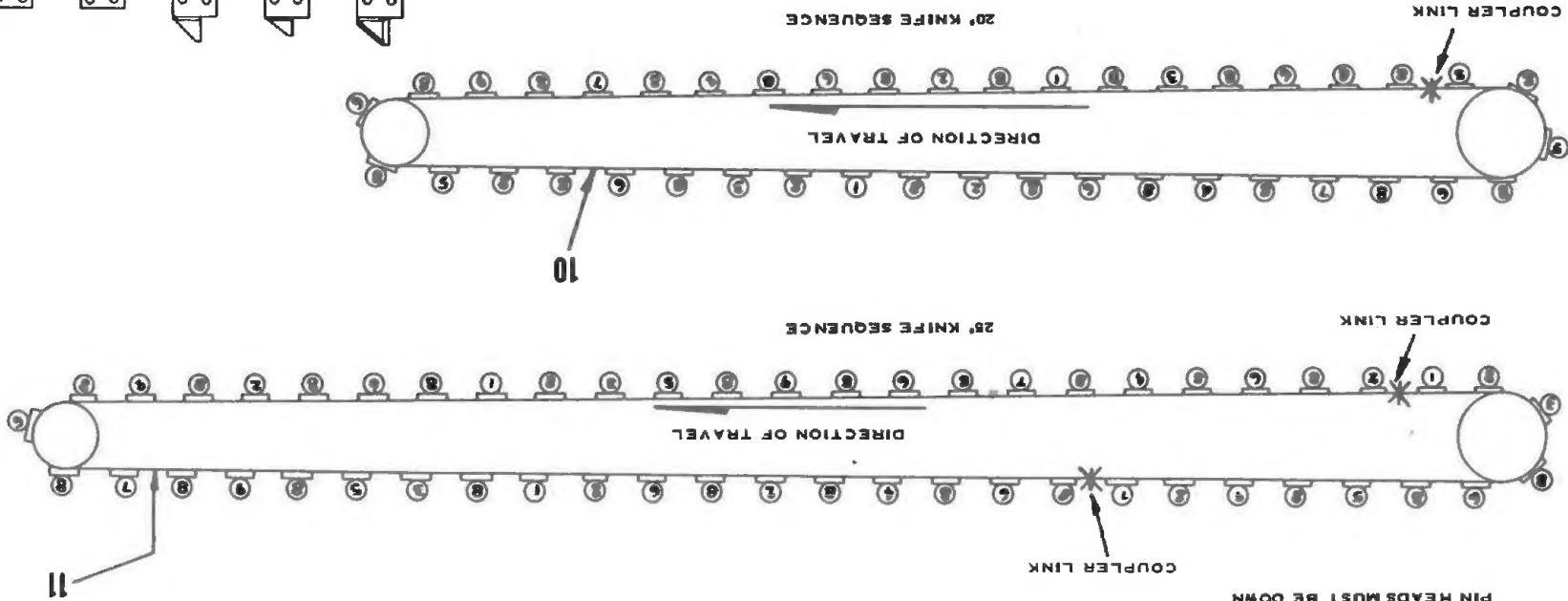
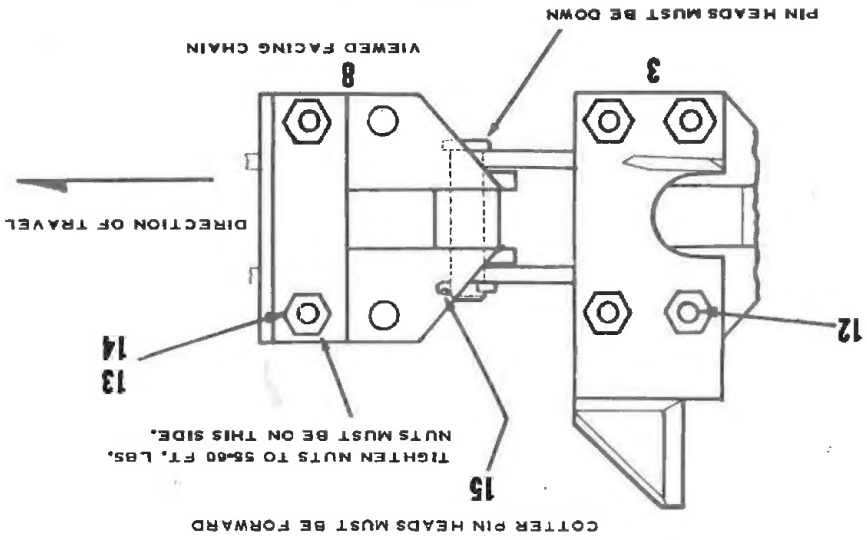
LOUVER TYPE GRAIN SHIELD



\*The grain cutter hook and unloading attachments must be attached to the cutter chain in the correct sequence. Refer to the grain cutter hook sequence chart.

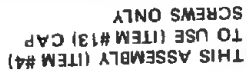
# GRAIN 20' CUTTER CHAIN & KNIFE ASSEMBLY - PART NO. 81414-0 25' CUTTER CHAIN & KNIFE ASSEMBLY - PART NO. 81414-0

ITEM	DESCRIPTION	QUANTITY	PART NO.
1	CUTTER KNIFE ASSEMBLY	2	81466-1
2	CUTTER KNIFE ASSEMBLY	3	81467-1
3	CUTTER KNIFE ASSEMBLY	3	81468-1
4	CUTTER KNIFE ASSEMBLY	3	81469-1
5	CUTTER KNIFE ASSEMBLY	2	81471-1
6	CUTTER KNIFE ASSEMBLY	6	81472-1
7	CUTTER KNIFE ASSEMBLY	3	81473-1
8	CUTTER KNIFE ASSEMBLY	25	81475
9	NARROW UNLOADING ATTACHMENT	22	81480-1
10	CUTTER KNIFE ASSEMBLY	2	80888-0
11	CUTTER CHAIN	1	80889-1
12	CUTTER CHAIN	12	17500-65
13	CAP SCREW - HEX HD.	137	17500-71
14	CAP SCREW - HEX HD.	106	12543-30
15	CUTTER PIN	13696-18	

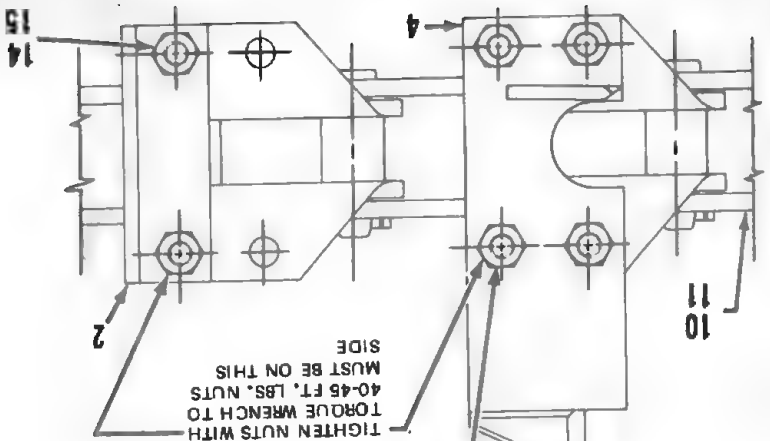


ON CUTTER KNIFE ASS'Y, #81468-1 USE CAP SCREW 17500-65 ONLY, ALL OTHER CUTTER HOOKS, KNIVES AND ATTACHMENTS USE CAP SCREW 17500-71.

25. KNIFE SEQUENCE 81470-0 AND 81470-2



TIGHTEN NUTS WITH  
TORQUE WRENCH TO  
40-45 FT. LBS. NUTS  
MUST BE ON THIS  
SIDE

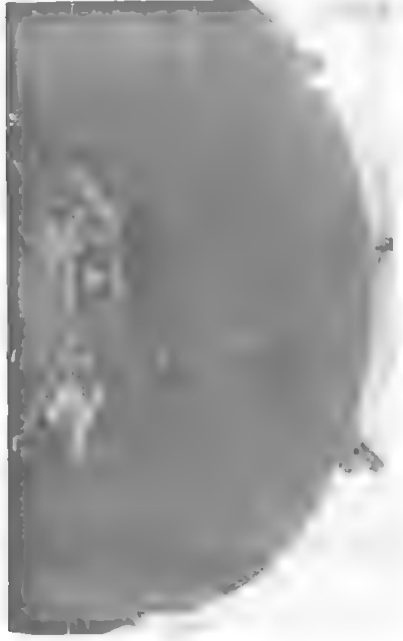


74-05.1 7/1/77

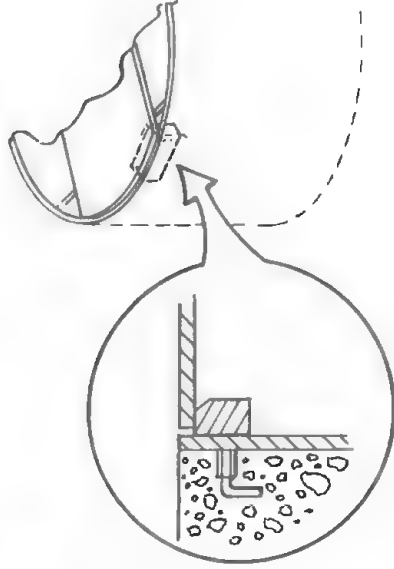


## UNLOADER HOOD ADJUSTMENT

1. Install extension plate. This plate must be used for free-flowing materials to keep the grain from flowing too rapidly onto the conveyor chain.

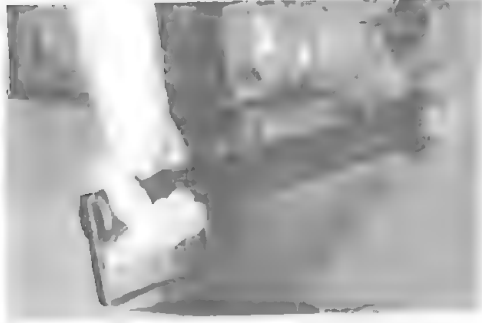


- Model SA09 25' X 65' and 25' X 80' (nominal dimension) structures only:
- The extension plate must rest on top of the extension plate support when the unloader is placed into structure.



2. The slides are adjusted through openings in the unloader housing using the lever provided with the hood unloader. Disconnect unloader power supply when adjusting slides.

- Remove the cap over the adjusting rod of the slide to be adjusted. Insert the lever into an opening in the rod.
- Slide is closed when moved all the way forward. Do not operate Unloader in free flowing material with left side slide closed as this will block material flow to conveyor chain.
- Left slide (as viewed facing outside of door frame) can be adjusted with the extension plate in place or removed.



TO OPEN SLIDE  
←

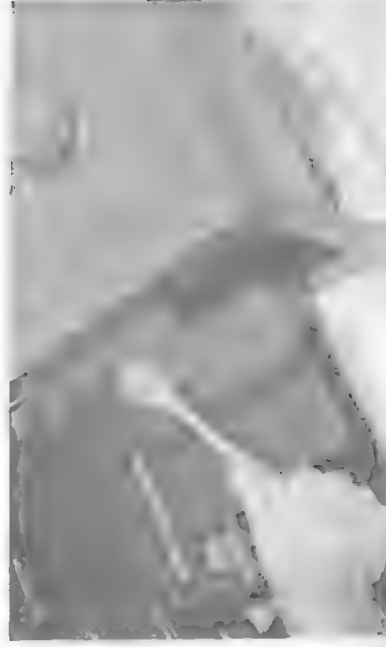


TO CLOSE SLIDE  
→

- Right slide can be adjusted only if the extension plate has been removed.
- Coat threads in pipe cap with approved sealer and replace cap.



3. The shutter on the backbone cover should be fully opened when Cutter Arm is lengthened. This will allow any "fines" of the grain at the end of the Cutter Arm to drop into the conveyor chain.



## UNLOADING HIGH MOISTURE BARLEY AND WHEAT

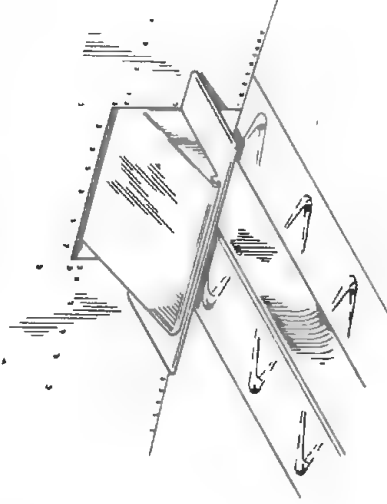
Specific unloader modifications must be made when unloading high moisture barley and wheat.

**Refer to section in this manual entitled, "Shortening the Cutter Arm", which must be used in conjunction with the following steps.**

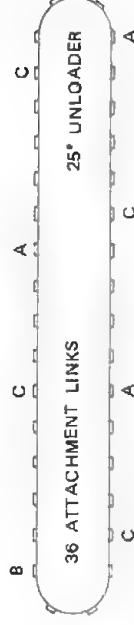
1. The unloader must be installed prior to filling the structure.
2. The hood assembly with extension plate must be installed. The shutter on the back-bone cover must be in the closed position.



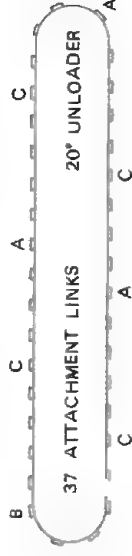
3. The canopy type door grain shield must be installed on the structure door frame area prior to filling.



4. Remove all the cutter hooks from the cutter chain.
5. Relieve the cutter chain tension and remove the chain.
6. Remove a 10 link chain section from the cutter chain on 20' unloaders. Remove 33 links from the cutter chain on 25' unloaders.
7. Remove the insert section from the cutter arm on 20' unloaders. Remove both insert sections from the cutter arm on 25' unloaders.
8. Reinstall the outboard arm section onto the center hub.
9. Install the shortened cutter chain on the cutter arm. Be sure to use a new stainless steel cotter key to secure pin in cutter chain.
10. Install and equally space three (3) 81472-1, one (1) 81483-1, and four (4) 81475 unloading angle attachments. Do not install hooks on the remaining attachment links on chain.



	QTY.
A-81472-1	3
B-81483-1	1
C-81475	4



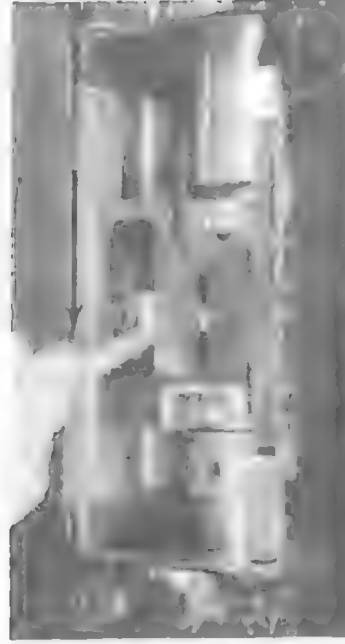
11. Check the tension of the conveyor chain---adjust as necessary.
12. Engage the ratchet drive arm and holding pawl to rotate the cutter arm one or two revolutions. On completion of one or two revolutions, disengage the driving and holding pawls allowing the cutter arm to free float.
13. In order to completely empty a structure, the unloader must be removed, the cutter arm and chain lengthened and the unloader reinstalled.

# SHORTENING THE CUTTER ARM 2"

1. Remove the inspection plate from the out-board section of the cutter arm.
2. Remove instruction plate and lock pin.



3. Tighten the set screw to back the pawl away from the ratchet.



4. Turn the jack screw into the sleeve until it is flush with the face of the sleeve.

• **IMPORTANT:** Use a 5/16" diameter pin punch to avoid distorting jack screw holes.

5. Push the fork assembly back as far as it will go.



- Remove cotter key.
- Use hammer or sledge to drive pin flush with top of chain side bar.
- Use punch to completely remove pin.

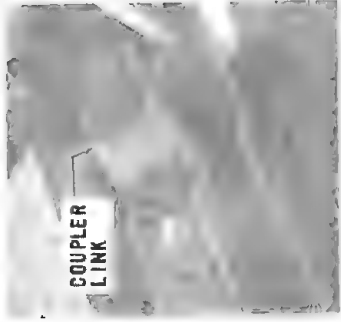


6. Shortening the cutter arm, 25' diameter (nominal dimension) structures:

Remove the 23 link chain section between the two coupler links when the 25' Goliath unloader is used in forages. Refer to forage cutter hook sequence chart.

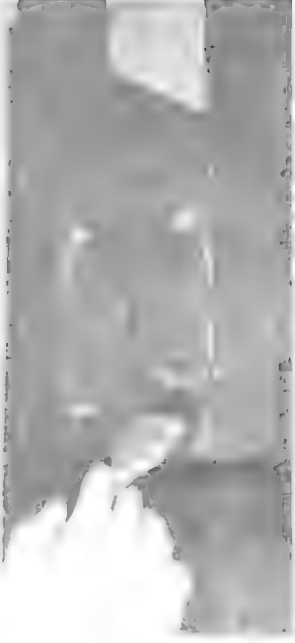


There are two coupler links in the chain... one must be left on the chain for reconnection.



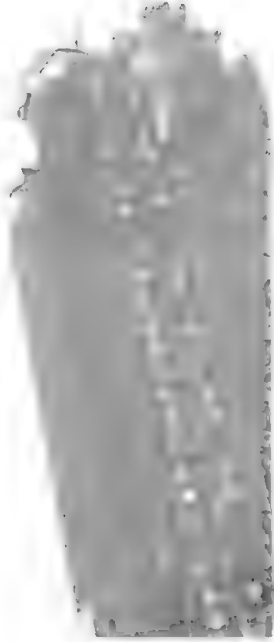
9. When connecting the shortened cutter arm:

- Generously coat the end of the center hub insert with Texaco Multi-Purpose No. 2 grease.
- Coat the threads of cap screws with lubricant and tighten to 150-160 ft. lbs. torque.



7. Remove the longest cutter arm insert section for forage and semi-free flowing material unloading.

- Remove both cutter arm insert sections and 33 link chain section for free flowing material unloading.



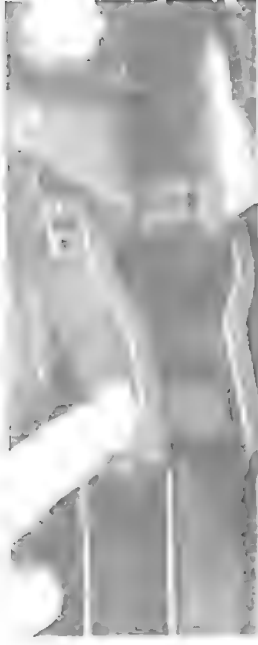
8. Shortening the cutter arm, 20' diameter (nominal dimension) structures:

- Remove the 10 link chain section when the 20' Goliath unloader cutter arm is shortened.
- Remove the insert section.
- There is one coupler link in the chain.



10. When connecting the cutter arm chain:

- Pack the bushing (pin opening) with Lubri-plate FML-2.



11. Use a new stainless steel cotter pin in the coupler link pin each time the chain is connected after separation.

12. Turn the set screw out until the pawl and ratchet are fully engaged and the set screw is loose.

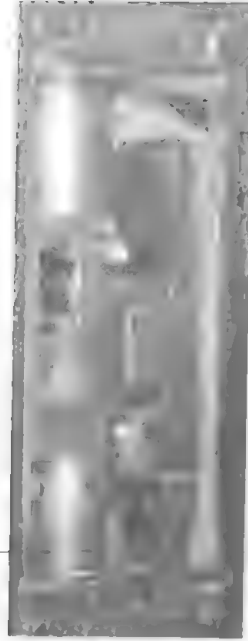


13. Turn the jack screw out until it reaches a positive stop.

- Use a 5/16" diameter pin punch to avoid distorting jack screw holes.



- Be sure the jack screw reaches a "positive stop" because the chain tightener springs offer much resistance.



**CAUTION:** The Unloader MUST NOT be run with the Jack Screw at the "Positive Stop" position or damage to the Chain Tightener Assembly Outer Tube may result.

14. Next, rotate the jack screw one full turn in the opposite direction.

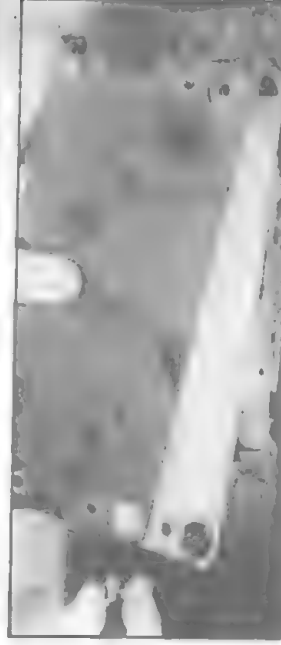
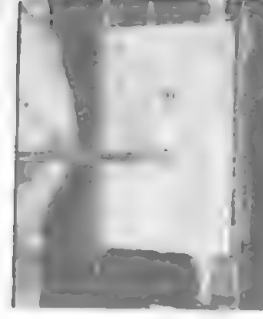
15. Lubricate with Texaco Regal Starfak No. 2 grease:



- By pumping into the two grease fittings.
- Packing the Housing.

16. Replace the lock pin and instruction plate.

17. Replace the gasket and inspection plate.



- Open the unloader discharge door.

# PREPARING STRUCTURE AND POSITIONING UNLOADER

1. Remove access and lower doors to install unloader.

The access door is replaced after the unloader is installed.



2. Forages:

The inner door\* must also be removed before installing the unloader. It is replaced after the unloader is installed.



3. Semi-free flowing material:

The louvers must also be removed before installing the unloader. They are replaced after the unloader is installed:



4. Free flowing material:

Remove louvers and louver type grain shield from door frame.



The louvers, door grain shield and access door will be replaced after the unloader is installed.

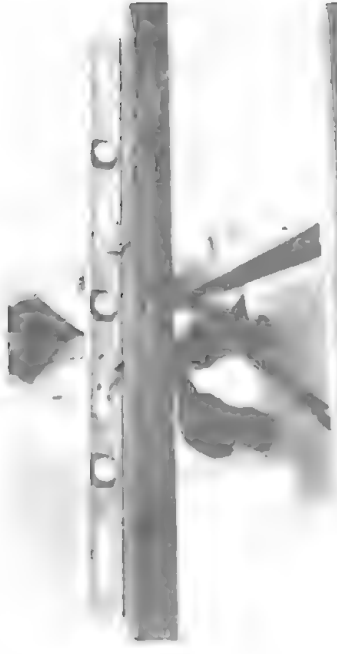
The louvers and door grain shield in door frame must be removed before installing the unloader. These are replaced after unloader is installed.

5. Place the support rails\*\* on sturdy sawhorses blocked to the proper height.

Install support angles or spacer rods to assure lateral stability of the rails.

The rail ends at the structure attach to the door frame. The opposite ends are held by the rail anchor.

The rails ends away from the structure must be level with those nearest the door. This will make it easier for the unloader to slide into the trough.



\*Standard on Model SA09 structures, optional on other models.

\*\*Optional, supplied with winch kit.

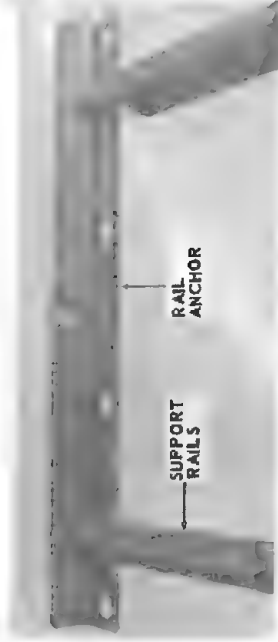
## IMPORTANT

6. Attach support rails\*\* to door frame...This is important to prevent rails from shifting when supporting the unloader.

The ends of the rails attach to sockets at the bottom of the door frame and are held in place by cap screws and nuts\*\*.

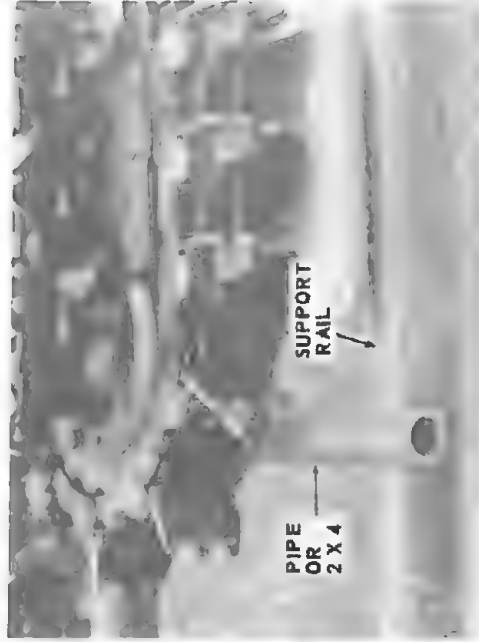


7. Slip the rail ends, which are away from the structure, into the rail anchor\*\* to assure proper spacing. Secure rails to rail anchor with cap screws and nuts.

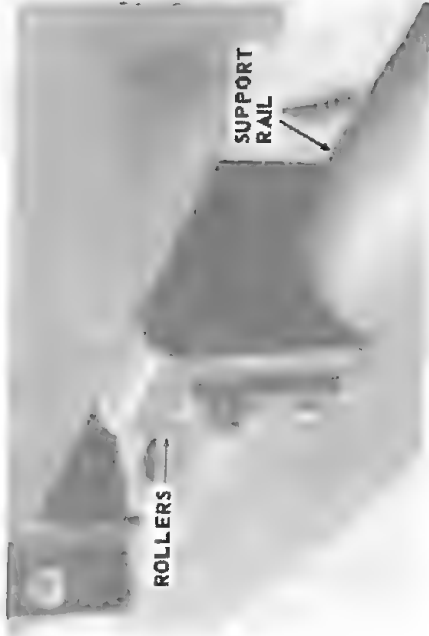


**CAUTION:** Disconnect the power supply while positioning the unloader prior to installation to prevent accidental operation of unloader.

8. Place a section of pipe or 2 X 4 across support rails near access frame door for support of center post assembly.



9. Position unloader with rollers under housing seated on support rails and center post assembly resting on pipe or 2 X 4.



10. "Pin" cutter arm at the "6 o'clock" position to align with door opening.



Just a head of the motor is an indicator dial similar to a clock face. The indicator shows the position of the cutter arm inside the structure.

The cutter arm is said to be in the "6 o'clock" position when it is directly above the backbone of the unloader.

Insert the pin through the ratchet wheel so the cutter arm will remain in this position as the unloader is being installed.

Shift the driving pawl to neutral so ratchet wheel will not turn during installation.

\*\*Optional, supplied with winch kit.

# DRIVING AND HOLDING PAWL OPERATION

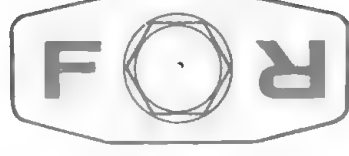
## DISCONNECT THE UNLOADER POWER SUPPLY

1. To set the Driving Pawl in the "Neutral" position.

Grasp the Driving Pawl Handle and pull out on it until the Roll Pin through the Pawl Shaft clears the top of the Detent Plate.

Rotate the Pawl Handle 90° and release it.

The Roll Pin through the Pawl Shaft should now engage the shallow slot in the Detent Plate. This is the "Neutral" position for each Pawl.



DRIVING PAWL  
HANDLE

FIGURE 2

Remove the Pin from the Ratchet Wheel and engage the Pawls to operate the cutter arm.

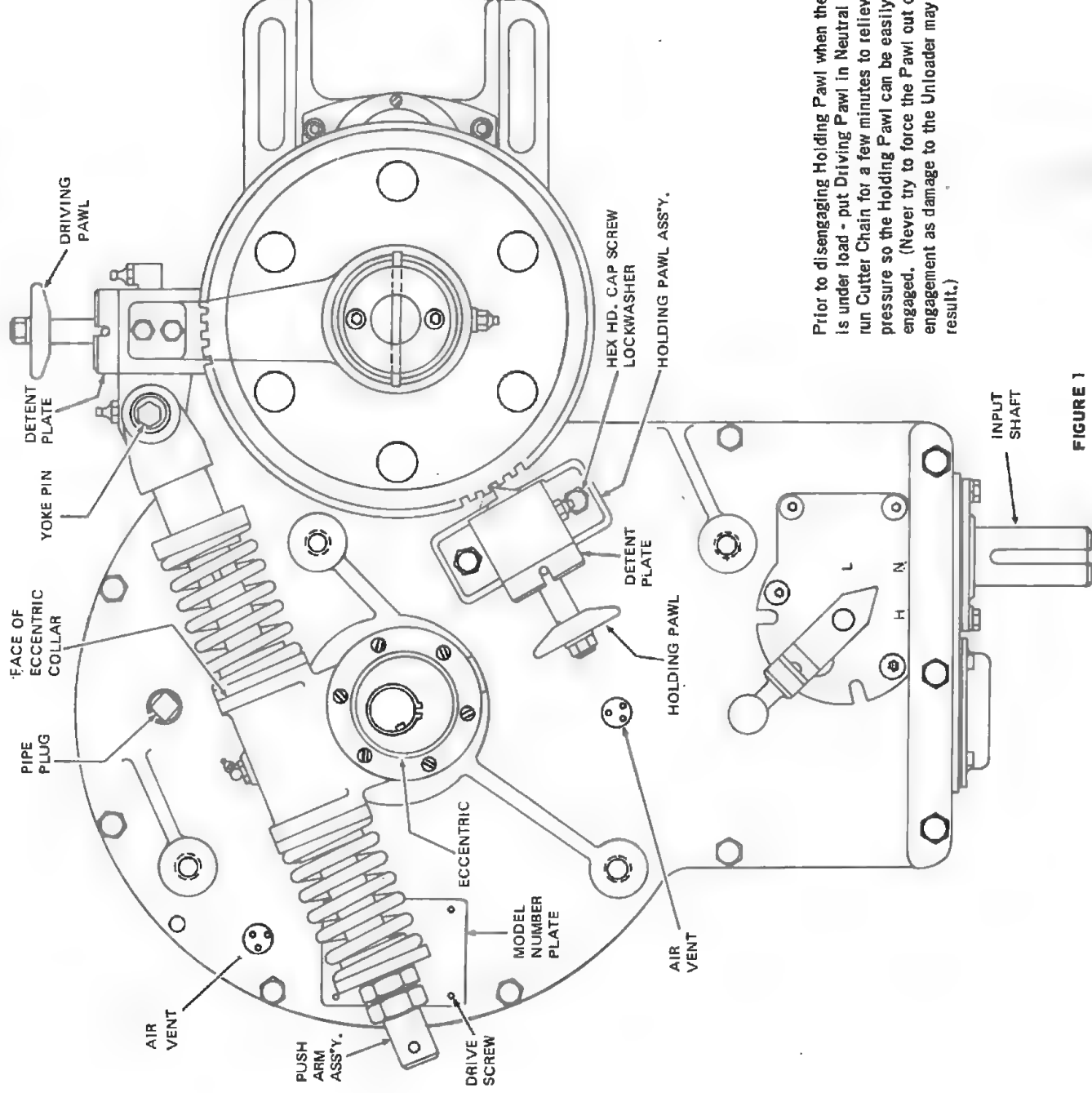
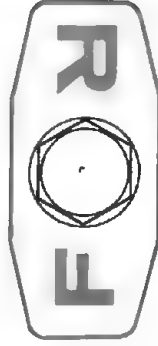


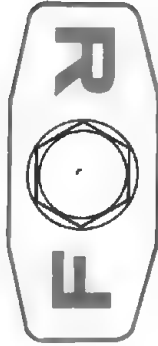
FIGURE 1

Prior to disengaging Holding Pawl when the Arm is under load - put Driving Pawl in Neutral and run Cutter Chain for a few minutes to relieve pressure so the Holding Pawl can be easily disengaged. (Never try to force the Pawl out of engagement as damage to the Unloader may result.)

2. The Pawls are set for forward (counterclockwise) operation of the Cutter Arm when the "F" cast on the Pawl Handles appears in a readable (rightside up) position. See fig. 3.



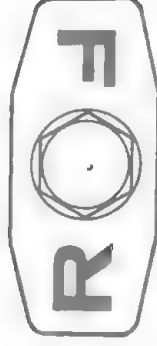
DRIVING PAWL HANDLE



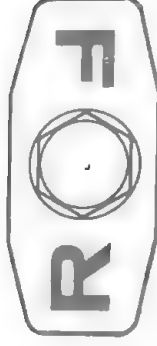
HOLDING PAWL HANDLE

FIGURE 3

3. The Pawls are set for reverse (clockwise) operation of the Cutter Arm when the "R" cast on the Pawl Handles appears in a readable (rightside up) position. See fig. 4.



DRIVING PAWL HANDLE



HOLDING PAWL HANDLE

FIGURE 4

NOTE: When changing direction of Cutter Arm Rotation after unloader has been installed and running for a period of time; shift the Driving Pawl into neutral and continue to run the Cutter Chain for a few minutes to relieve the pressure on the arm which will permit easier disengagement of the Holding Pawl and reduce the possibility of Ratchet Wheel recoil.

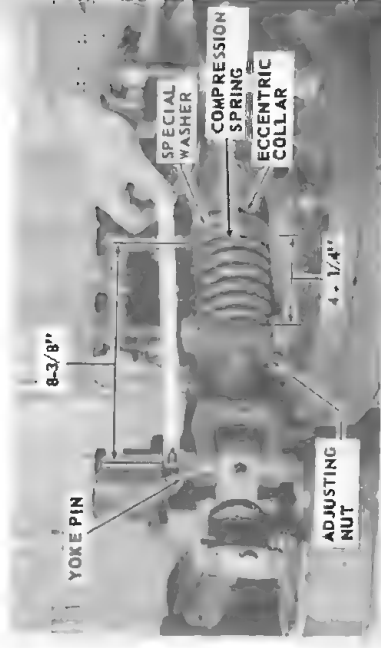
## REVERSING ARM MECHANISM ADJUSTMENT

### DISCONNECT THE UNLOADER POWER SUPPLY

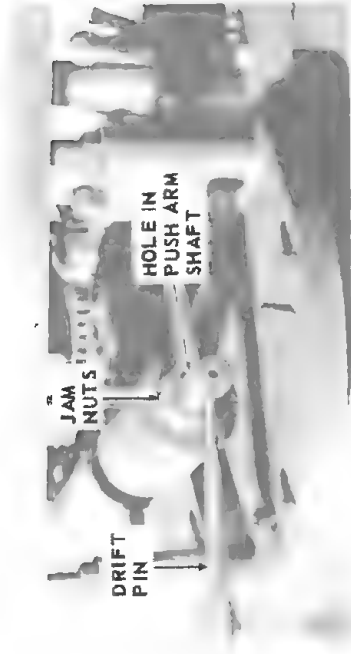
1. Adjustment of counterclockwise (Forward) rotation of the Cutter Arm.
  - When the Driving and Holding Pawl Handles are set so that the letter "F" which is cast into them appears in a readable (right-side up) position and the letter "R" appears in an unreadable (upside down) position, the Unloaders Cutter Arm is set for "Forward" operation.
2. Bring the Push Arm (Ratchet-Drive Arm) to the farthest forward position on the Eccentric by turning the input shaft. See fig. 1.
3. Set the distance between the center of the Yoke Pin and the Face of the Eccentric Collar at approximately 8-3/8".

- To adjust for this measurement:

- Loosen the Slotted Nut under the Compression Spring nearest the Yoke.



- Rotate the Push Arm Shaft in a clockwise direction to shorten - and in a counter-clockwise direction to lengthen the distance between the Face of the Eccentric Collar and the center of the Yoke Pin.



4. With the Driving Pawl and Holding Pawl set for forward operation (as shown in fig. 3), the Driving Pawl should fully engage the Ratchet Wheel.

- If necessary, adjust the distance between the face of the Eccentric Collar and the center of the Yoke Pin to obtain full engagement.

- At this point, the Holding Pawl should be in an "overtravel" condition.

5. Rotate the input shaft to complete one (1) full cycle of the Driving Pawl.

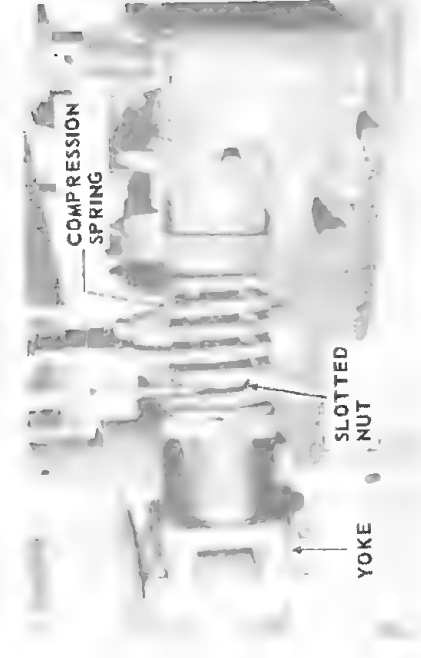
- Check the overtravel of both the Driving and Holding Pawl to see if they are equal.

- If they are not equal, shorten or lengthen the distance between the face of the Eccentric Collar and the center of the Driving Pawl Shaft to obtain equal overtravel for both Pawls. This is done by repeating Steps 2 through 4.

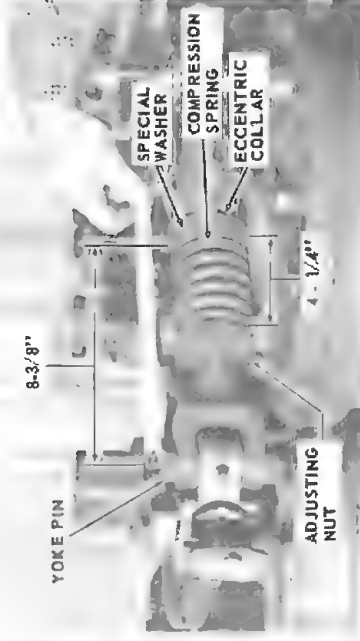
**CAUTION:** When adjusting for equal overtravel of the Driving and Holding Pawls, the distance between the face of the Eccentric Collar and the center of the Yoke Pin **SHOULD BE KEPT AS CLOSE TO 8-3/8" AS POSSIBLE.**

6. When final adjustments have been completed:

- Tighten the Slotted Nut against the Yoke to hold the distance between the face of the Eccentric Collar and the center of the Driving Pawl Shaft.



7. Set both Compression Springs at their normal operating setting of 4-1/4". (Measurement is for Spring ONLY.)



8. If it is desired to vary the Compression Spring pressure for counter-clockwise operation of the Unloader Cutter Arm:

- Turning the Adjusting Nut toward the Spring will increase pressure.
- Turning the Adjusting Nut away from the Spring will decrease pressure.
- For normal operation, the Compression Spring length should be set at 4-1/4" to 4-3/8".

**CAUTION:** Do not set Compression Spring length at less than 3-5/16" as serious damage to unloader may result.



9. If it is desired to vary the Compression Spring pressure for clockwise operation of the Unloader Cutter Arm:



- Insert a Drift Pin in the Hole at the rear of the Push Arm Shaft to prevent it from turning and to hold its adjustment while varying the adjustment of the Compression Spring.
- Loosen the rear (locking) Jam Nut.
- Turning the Jam Nut nearest the Compression Spring toward spring will increase pressure.
- For normal operation, the Compression Spring length should be set at 4-1/4".
- When adjustment is complete, tighten the REAR (locking) Jam Nut against the Jam Nut nearest the Compression Spring to lock this setting.

## INSTALLING THE UNLOADER

Never operate the unloader without all belt guards in place.

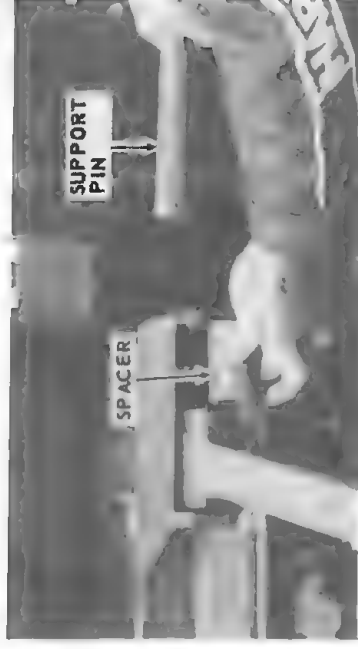
We definitely recommend the use of the "UNLOADER INSTALLATION PULLER FRAME ASSEMBLY" when installing the Unloader into structure.

- This Puller Assembly puts the person behind the Unloader and away from moving chains.
- UNDER NO CIRCUMSTANCES is anyone to stand between the Support Rails at ANY TIME when installing or removing the Unloader.
- UNDER NO CIRCUMSTANCES is anyone to stand on either side of the exposed chains during installation or removal of Unloader from structure.
- The unloader puller frame assembly is available as an accessory from your Harvestore dealer.



**CAUTION:** NO power should be connected to the Unloader at this time.

1. Install the Puller and Tube Assembly to Unloader.
2. Install a Spacer to both sides of the Puller and Tube Assembly. (For 25'-0" Unloaders only.)
3. Secure (25' dia. structures only) Puller and Tube Assembly to the Unloader with the Support Pins.



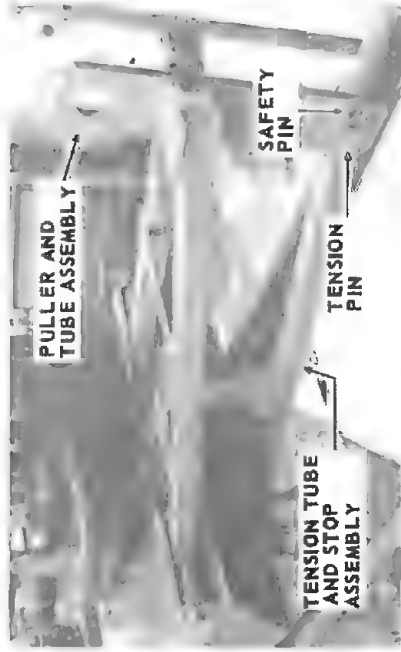
- After the Support Pin Assembly Pins have been installed, secure them with Safety Pins.



4. Assemble Tension Tube and Stop Assembly to the Puller and Tube Assembly.

- Secure it in place with the Tension Pin Assembly.

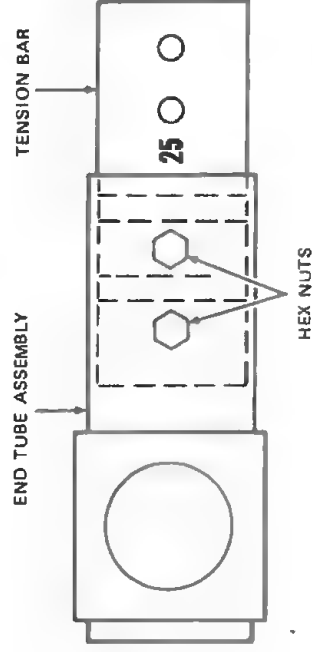
- Secure the Tension Pin Assembly in place with Safety Pin.



5. Assemble the Tension Bar to the End Tube assembly with two Cap Screws and Hex Nuts.

- The Tension Bar is Provided with two sets of holes drilled at right angles to each other for length adjustment of the Tension Tube Assembly to accommodate both 20' and 25' Unloaders. Adjacent to each set of holes the numbers 20 or 25 is stamped corresponding to size of Unloader.

- When adjusting for the proper length, the number corresponding to the size of the Unloader should appear adjacent to the holes in the End Tube Assembly.

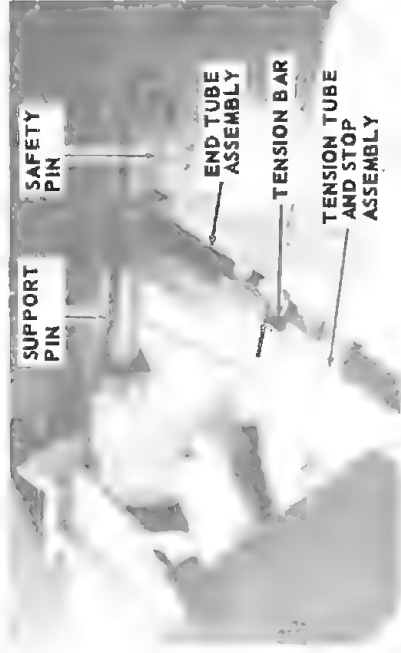


6. When the Tension Bar has been assembled to the End Tube Assembly for either 20' or 25' Unloader:

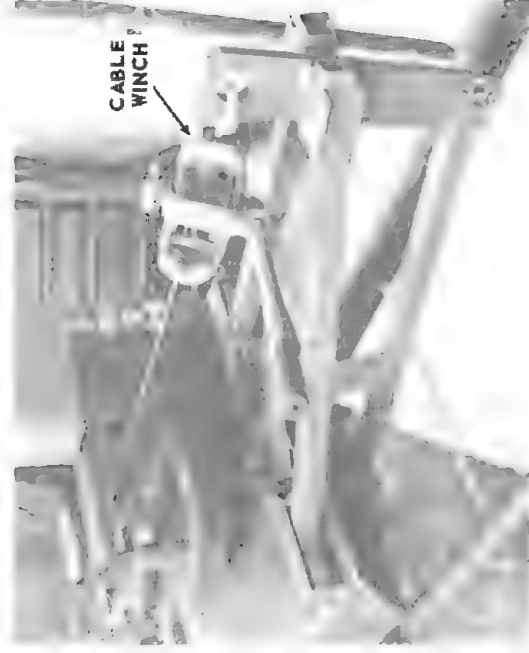
- Install the remaining end of Tension Bar into the Tension Tube and Stop Assembly.
- Secure it in place with two Hex Nuts and Cap Screws.

7. Connect the end of the End Tube Assembly with the large hole to the Unloader by inserting a Support Pin through the Puller Bar on the Unloader Housing and through the End Tube Assembly.

- Secure the Support Pin in place with a Safety Pin.



8. Anchor a Cable Winch to the vertical section of the Puller Frame Assembly.

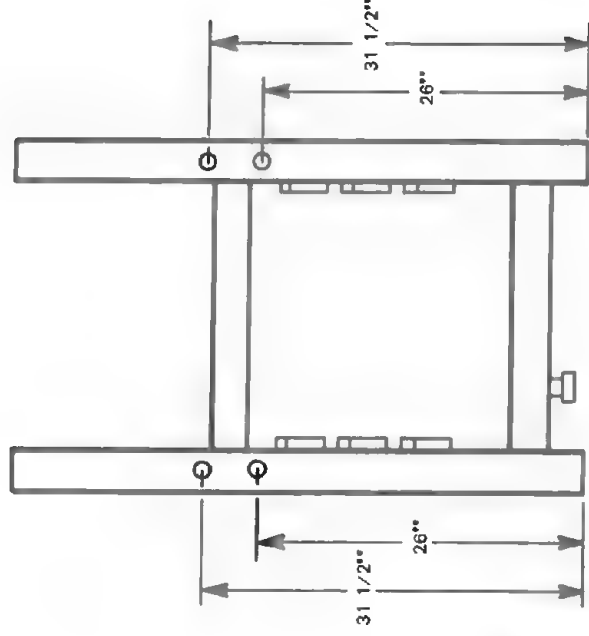


9. Thread the Cable from the Cable Winch under the Motor Mount and over the Ratchet Wheel.

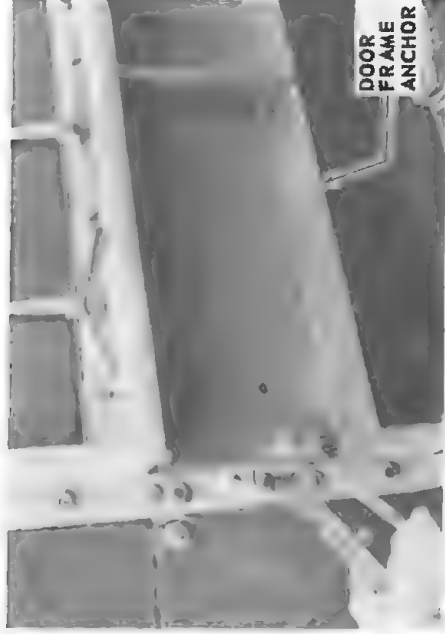


10. Install the Door Frame Anchor to the Door Frame with 1/2" Cap Screws, Nuts and Washers. (Holes in door frame may or may not be provided.)

- If holes are not provided in door frame, measure up from the bottom edge of the Door Frame on each side 26" and 31 1/2" respectively.
- Make a horizontal line on the Door Frame at these two distances.



- Use the Door Frame Anchor as a template for drilling four 9/16" diameter holes. Position it over the horizontal lines previously drawn and secure it with "C" Clamps.
- Drill four 9/16" holes.
- Secure the Door Frame Anchor to the structure Door Frame with 1/2" Cap Screws, Nuts and Washers.

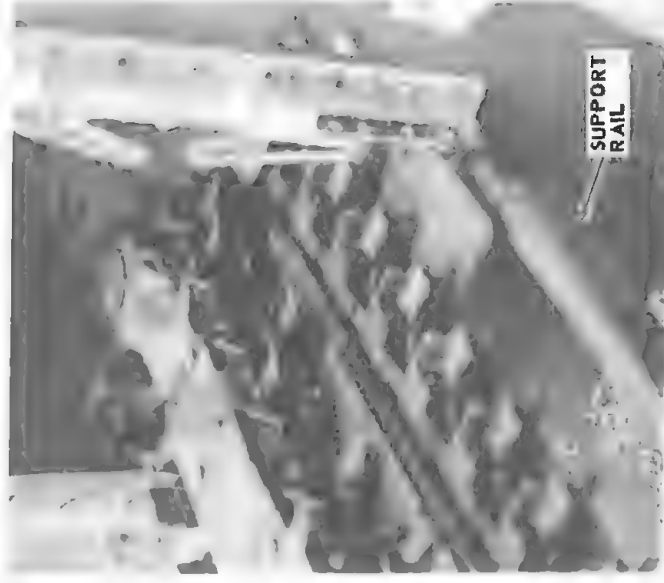


11. Secure the Cable from the Cable Winch to the Door Frame Anchor.



12. To draw Unloader into structure:

- Remove material from bottom of door frame area to allow unloader center post assembly to rest on door frame.
- Be sure Unloader Center Post or "nose" is a few inches inside Door Frame before connecting power to and starting Motor. This will prevent the possibility of the Unloader being thrown to the side and falling off the Support Rails.



- Remove section of pipe or 2 X 4 from beneath Center Post Assembly.

**CAUTION: STAY AWAY FROM CUTTER AND CONVEYOR CHAINS! DO NOT STAND BETWEEN SUPPORT RAILS AT ANY TIME!**

- Connect power to the Unloader. Start and stop the Unloader intermittently so it will dig its way into the material and supplement the pull of the Cable Winch.

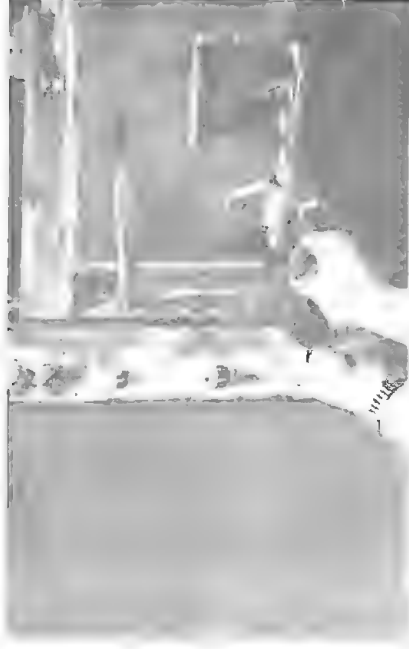


13. Apply approved sealer to the Door Frame or Unloader Housing Flange when the Unloader is within a few inches of being in place.

This is done to provide a seal between the Unloader and Door Frame.



14. Remove Support Rails, Rail Anchor and Supports.
15. Pull the Unloader tightly against the Door Frame.
  - Align holes with a Drift Punch and Bolt Unloader Housing Flange to Door Frame.
  - Be sure to install a bolt in all bolt holes in the Unloader Flange.



16. Remove the Cable Winch, and the Door Frame Anchor.
17. Where used, Install Inner Door or Louvers.
18. Install Access door.



- Check condition of door gasket. Replace gasket if cut, cracked or torn.
- Bolt access door securely to frame.



19. Remove pin from ratchet wheel and engage the pawls to operate the cutter arm.
  - The unloader is now ready for use.

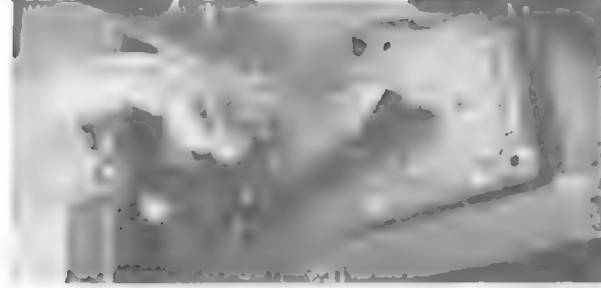
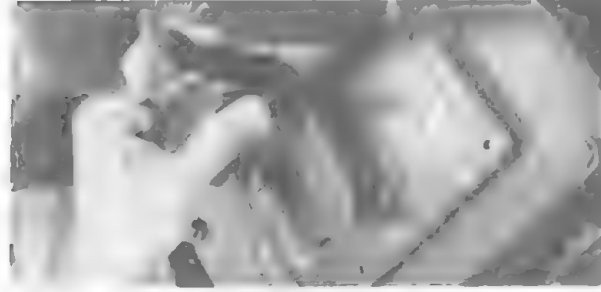


# UNLOADER OPERATION

Counter-clockwise rotation of cutter arm is recommended while using the shortened cutter arm.

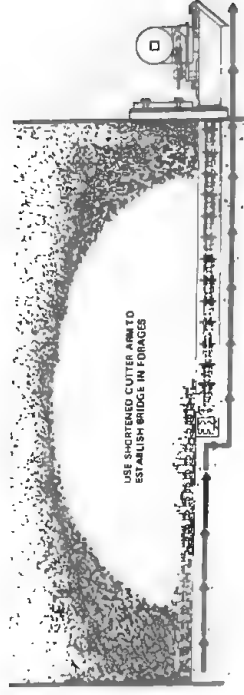
1. The transmission should be started and operated in "low" speed at the start of a feeding period. After a few minutes of operation the unloader may be shifted, if desired, to "high" speed as follows:

- DISCONNECT POWER TO UNLOADER BEFORE SHIFTING.



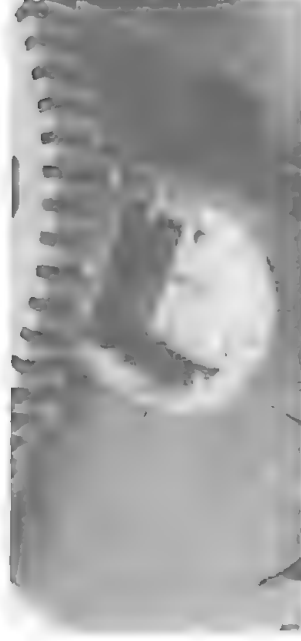
2. If necessary, rotate the driven sheave with the hand crank to aid in meshing gears.
2. Do not use the shortened cutter arm continuously, excessive use may affect material delivery when the long arm is installed under otherwise normal operating conditions.
3. In forages, three to five revolutions of the shortened cutter arm should be made to establish a "bridge".

- In semi free-flowing material, a bridge will not be formed unless the material exceeds 30% moisture content.
- In free-flowing material, a bridge will usually not be formed.

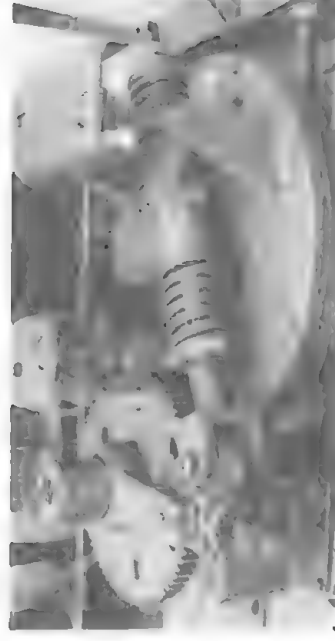


4. When the bridge has been established:

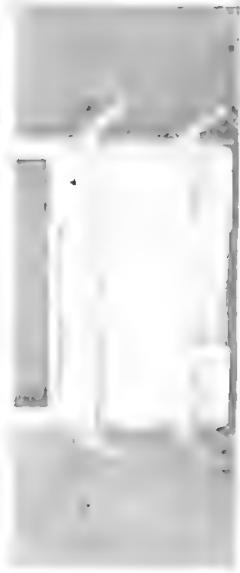
- The cutter arm must be centered on the unloader backbone (6 o'clock position), and the ratchet wheel "pinned".



- Shift the driving pawl to neutral so ratchet wheel will not turn during unloader removal.



- Remove the upper door.



- Remove the inner door or louvers.

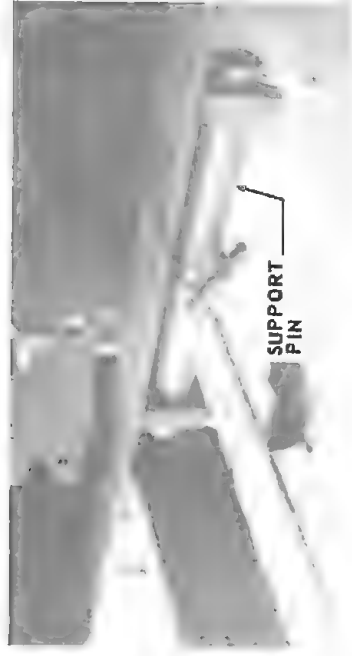
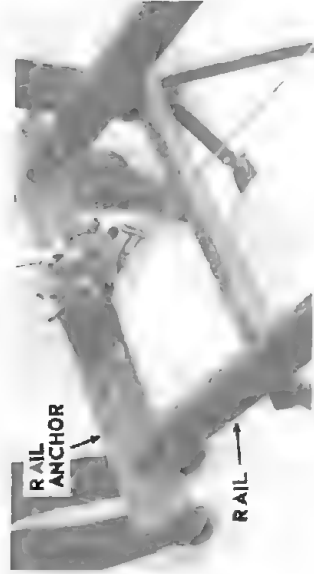


5. Remove the bolts securing unloader flange to door frame.



6. Refer to steps 5 thru 10 under "Preparing Structure and Positioning Unloader", for support rail installation.

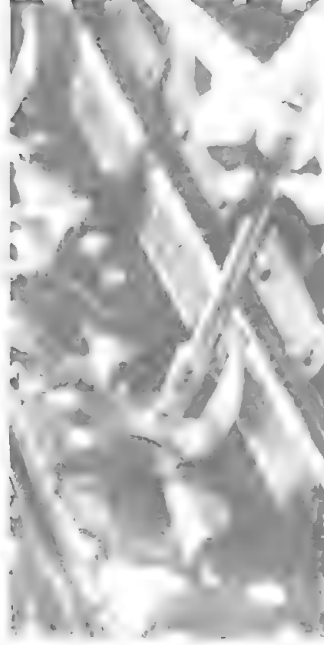
7. Attach a cable winch to hole in center of rail anchor. Attach hook on cable to one of the lugs below discharge door of unloader.



- If unloader puller frame is in place at the time of unloader removal, hook of cable winch must be attached to support pin instead of to lug below discharge door.
8. As unloader is being removed, run the motor in short intermittent spurts to clear the cutter arm and trough of material.
  9. Loosen the chain tightener and disconnect the cutter chain and cutter arm.
  - Reinstall the arm insert and chain section(s) which were previously removed during shortening of cutter arm.
  - The removed chain section(s) must be replaced in their original positions.



- Be sure to use a new stainless steel cotter pin in the chain at the assembly points.
- Reset chain tightener. Check cutter and conveyor chain for loose attachments.



- Check lubrication points for sufficient lubricant.
- Reinstall the unloader.

As an aid to unloader operation, it is suggested that on the first revolution of the lengthened cutter arm, run the cutter arm in a clockwise rotation from the "6 o'clock" to the "9 o'clock" position only. Chains are to be run in the forward direction. **DISCONNECT POWER TO THE UNLOADER.**

Shift driving and holding pawls for counter-clockwise rotation of cutter arm.

#### CONNECT POWER TO UNLOADER.

USE CONTINUOUS COUNTER-CLOCKWISE ROTATION OF THE CUTTER ARM FOR UNLOADING REMAINDER OF STRUCTURE. Chains should be run in the forward direction. **OPERATING CUTTER ARM INTERMITTENTLY IN FORWARD AND REVERSE DIRECTIONS CAN CAUSE SERIOUS STRUCTURAL DAMAGE.**

When completely unloading (cleanout) a structure that has been filled with free-flowing material, the lengthened cutter arm should be rotated counter-clockwise. The chains can be run in forward or reverse direction.

#### FOR UNLOADING FORAGES AND SEMI-FREE FLOWING MATERIALS:

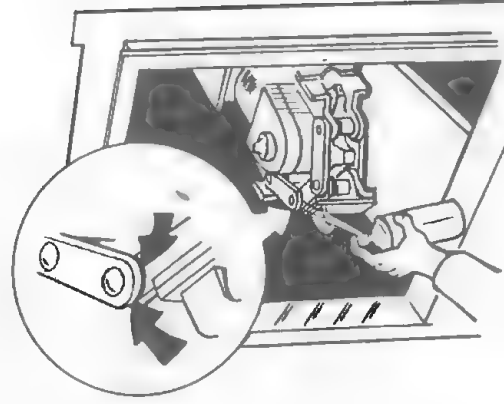
Each time one-half the structure has been unloaded, good management requires;

- (a) the unloader be removed;
- (b) the possibility of link removal in the cutter or conveyor chain be checked;
- (c) the chain tightener reset;
- (d) the chain attachments checked and tightened; and
- (e) the unit be lubricated.

## PREVENTIVE MAINTENANCE GUIDES

### TO LUBRICATE CHAINS

Use Harvestore Cutter and Conveyor Chain Spray Lubricant to oil the chain without removing the unloader from the structure. Use this oil to supplement, not replace, the lubrication instructions recommended in the manual.

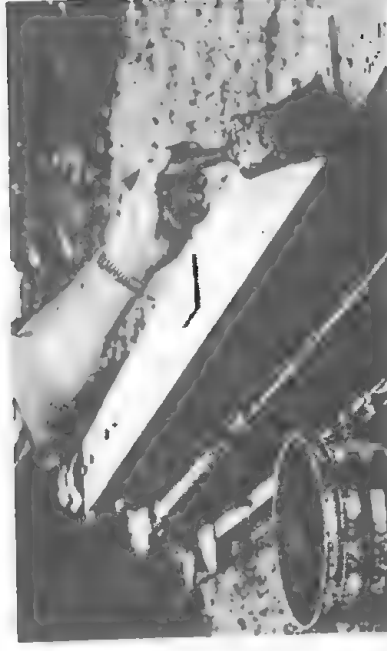


This spray type oil is available at your Harvestore Dealer.

Oil spray the chains at least once a month. By spraying the lubricant into the chains with a pressurized can, the working parts are oiled and a barrier is formed against the acids in the stored material.

#### CARING FOR IDLE EQUIPMENT

- The unloader should always be removed from the structure when not in use. Remove the chains from the unloader, then use a brush to spread a coat of oil over the entire surface of the unloader. Lubricate all lube points.





- While the chains are off, store them in a barrel of oil. This assists in preventing corrosion and keeps the chains flexible.

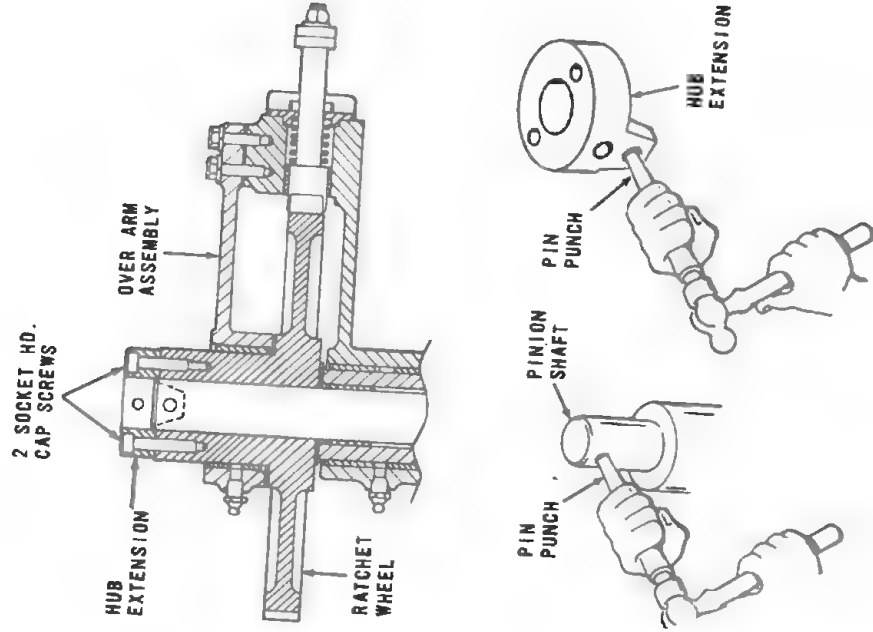


### BRASS SHEAR PIN REPLACEMENT

To prevent overloading the Cutter Arm and perhaps causing serious gear damage, the ratchet wheel is equipped with a brass shear pin. The ratchet wheel will turn freely when this pin has sheared.

To replace the brass shear pin:

1. Remove the two socket head capscrows from the Hub Extension.



2. Remove the hub extension.

- Dis-engage the driving and holding pawls.
  - With a pin punch and mallet, drive the sheared brass pin segments from the hub extension and from the pinion shaft.
3. Re-install the hub extension over the pinion shaft.
  4. Align the shear pin hole in the hub extension with the shear pin hole in the pinion shaft by rotating the ratchet wheel.
  5. Install a new brass shear pin so that its ends are flush with the outside edges of the Hub Extension.

**CAUTION: USE SPECIAL SHEAR PIN ONLY** - available from your Dealer.

6. Re-engage the driving and holding pawls.
7. Re-install the two socket head capscrows which secure the hub extension to the ratchet wheel hub. They **MUST** be torqued to 20 FOOT POUNDS each.

### CUTTER CHAIN ADJUSTMENT

DISCONNECT POWER SOURCE BEFORE CHECKING CUTTER CHAIN OR CHAIN TIGHTENER.

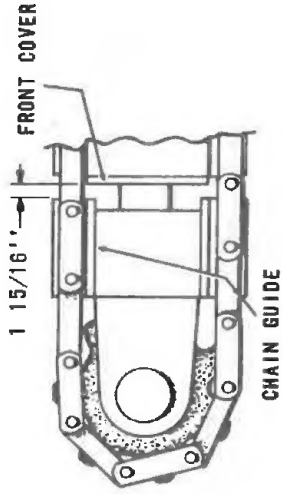
Whenever the unloader is out of the structure, or after every 50 hours of operation, reset the chain tightener in accordance with the instructions in this manual.

At this time check the cutter chain for wear to determine if a link should be removed.

On the Goliath 20' unloader, when the distance between the front cover on the arm outboard section and the chain guide measures 1 15/16, remove the coupler link from the chain.

On the Goliath 25' unloader, when this distance measures 2 1/16", remove a coupler link from chain.

**CAUTION: DO NOT REMOVE THE COMPRESSION SPRINGS FROM THE CHAIN TIGHTENER TUBE. CONTACT YOUR HARVESTORE DEALER FOR THIS SERVICE.**



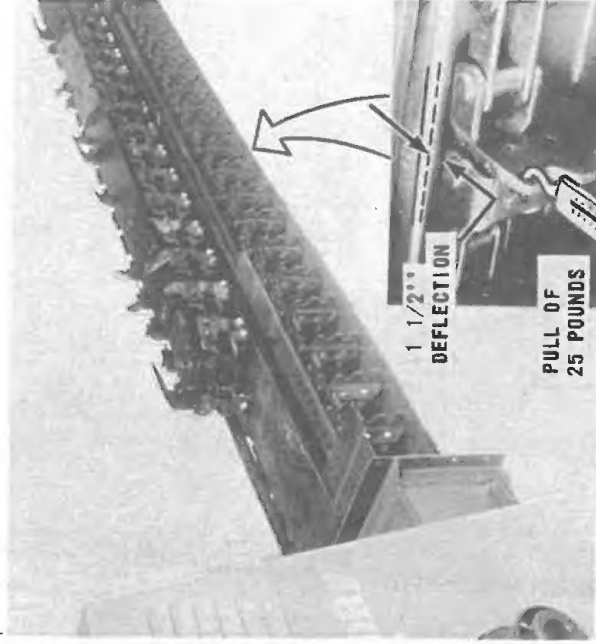
### CONVEYOR CHAIN ADJUSTMENT

Whenever the unloader is out of the structure, or after every 50 hours of operation, check the conveyor chain tension.

**DISCONNECT THE POWER SOURCE TO MOTOR PRIOR TO CHECKING CHAIN TENSION.**

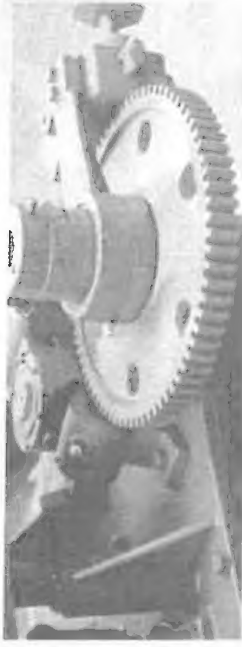
Correct tension is determined by:

- At a point midway between the double sprocket and the drive sprocket, a pull of 25 pounds is necessary to move the chain away from the unloader backbone 1 1/2".



Should conveyor chain need adjustment:

- Disengage the driving and holding pawls from the ratchet wheel.



- Loosen the cap screws securing the main drive to the unloader housing.



- Loosen the locknut on the adjusting screw.



- We suggest using a pry between the unloader housing flange, at the unloader discharge door end, and the main drive assembly to break seal between these two parts.
- To tighten chain, turn the adjusting screw into (clockwise rotation) the main drive assembly.
- Turning the adjusting screw counter-clockwise will move main drive assembly forward and loosen the conveyor chain.



When adjustment has been completed:

- Tighten the locknut on the adjusting screw.
- Tighten the cap screws securing the main drive assembly to the unloader housing.
- Torque cap screws to 100-110 foot pounds.
- Engage the driving and holding pawls to the ratchet wheel.

The conveyor chain can also be checked for tightness, should the unloader be installed and in operation, in the following manner:

- STOP MOTOR.
- Disengage the driving pawl at ratchet wheel.
- START MOTOR.

- Allow the unloader to run until the conveyor chain has had a chance to deliver all material in trough area.

#### • STOP MOTOR AND DISCONNECT THE POWER SUPPLY.

- Reach in the discharge opening, past the drive sprocket, and grasp a conveyor flight.

- Pull the conveyor flight toward you.

- Should you notice a deflection of the conveyor flight, chain needs to be tightened.

- Disengage the holding pawl and driving pawl ratchet wheel.

- Loosen the cap screws securing the main drive assembly to the unloader housing.

- Loosen the locknut on the adjusting screw.

- Use a pry between the angle, at the top of discharge end and main drive, to break the seal between the main drive assembly and unloader housing.

- Turn the adjusting screw into (clockwise rotation) the main drive.

Check the deflection of the conveyor flight occasionally while turning the adjusting screw, DO NOT OVERTIGHTEN. When no deflection is noticed:

- Tighten the locknut on the adjusting screw.
- Tighten the cap screws securing the main drive assembly to the unloader housing to 100-110 pounds of torque.

- Engage the driving and holding pawls.

- Connect the main power supply and resume operation.

It will be necessary to remove a link from the conveyor chain when the cap screws securing the main drive assembly to the unloader housing are noticed to be very close to the end of the slot in the casting.

To remove a link from the conveyor chain:

- Remove the unloader from the structure.

- Locate the coupler link in the chain and run unloader until coupler link is at a midway point between the double sprocket and drive sprocket.

#### • DISCONNECT THE POWER SUPPLY.

- Disengage the driving and holding pawls at the ratchet wheel.

- Loosen the locknut on the adjusting screw.

- Loosen the cap screws securing main drive assembly to unloader housing.

- Use a pry between angle on housing and main drive to break the seal.

- Turn the adjusting screw out of (counter-clockwise rotation) the main drive.

- Remove the cotter keys from the chain pins securing the coupler link.

- Remove the chain pins.

- Remove the coupler link.

- Pack the bushing hole for chain pin with lubricate grease.

- Install the chain pin and secure, using a new stainless steel cotter key.

- Turn adjusting screw into (clockwise rotation) the main drive.

- When 25 pounds of pull at the midway point in chain is required to move chain 1 1/2" from backbone, correct tension has been reached.

- Tighten locknut on adjusting screw.

- Tighten the cap screws securing main drive to unloader housing to 100-110 foot pounds of torque.

- Pin ratchet wheel. Re-install unloader.

## BELT TENSION ADJUSTMENT

The drive belts, between the motor and driven sheave, should be checked occasionally for proper tension.

- DISCONNECT THE POWER SOURCE TO MOTOR PRIOR TO CHECKING OR ADJUSTING BELTS.

- The best tension for a V-belt drive is the lowest tension at which the belts will not slip under the highest load condition.

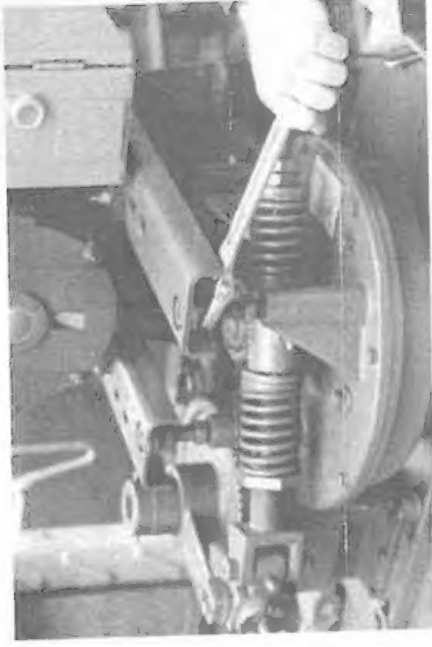
- Check the tension on a new drive, frequently during the first few hours of operation.

- Check the drive tension periodically, thereafter.

- Too much tension shortens belt and bearing life.

- Keep belts and sheaves free from any foreign material which may cause slip.

- DISCONNECT THE POWER SOURCE TO MOTOR PRIOR TO CHECKING OR ADJUSTING BELTS.






To adjust belt tension:

- Loosen the four locknuts.
- Turn the adjusting screws out of the boss in the transmission cover (counterclockwise) to tighten belts.
- Motor must be level so all belts will have same tension.
- On completion of adjustment, tighten the four locknuts to hold adjustment.

## BOLT TORQUE

GENERAL THREADED FASTENER TORQUE VALUES, IN FT. LBS., TO BE USED ONLY WHERE FASTENERS ARE USED IN STEEL THREADED PARTS AND MINIMUM LENGTH OF THREAD ENGAGEMENT IS EQUAL TO ONE DIAMETER OF THE FASTENER.

ONE DIAMETER OF THE FASTENER

Fastener Type and Grade	Fastener Size - Lubricated						Fastener Size - Non Lubricated					
	1/4	5/16	3/8	7/16	1/2	5/8	1/4	5/16	3/8	7/16	1/2	5/8
 Hex. Hd. Cap Screw, Gr. 1 or 2 and all types of Machine Screws	3	5	10	15	23	47	4	7	13	21	31	62
 Hex. Hd. Cap Screw Gr. 5	7	14	25	40	60	120	9	19	33	53	80	160
 Hex. Hd. Cap Screw Gr. 8 and all alloy steel 12 pt. and recessed Soc. Cap Screws	10	20	35	56	80	170	13	26	46	75	114	226

Special fastener torque requirements to be specified individually.

# DRIVING AND HOLDING PAWL CONVERSIONS

To convert the driving and holding pawl assemblies of 20' unloaders manufactured prior to serial number 77026174 and 25' unloaders manufactured prior to serial number 77026142 from requiring grease for lubrication to the use of S.A.E. #10 oil for lubrication, proceed as follows:

1. Remove cover with pawl and spring assembly from housing. See fig. 1.

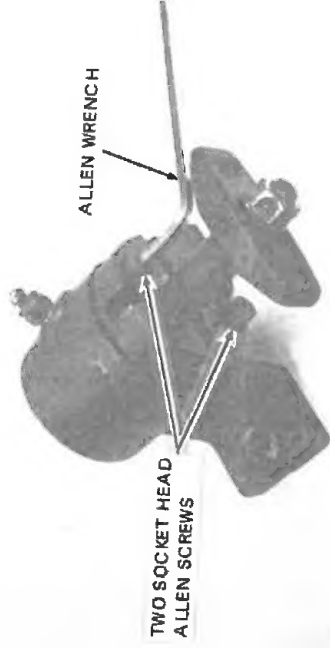


FIGURE 1

2. Rinse assembly in kerosene or diesel fuel and wipe clean of all old grease.
3. Remove all old grease from housing.
  - Clean inside of housing with kerosene or diesel fuel and wipe clean.
4. Remove grease fitting from housing. See fig. 2.
5. Install oil hole cover where grease fitting was. See fig. 3.

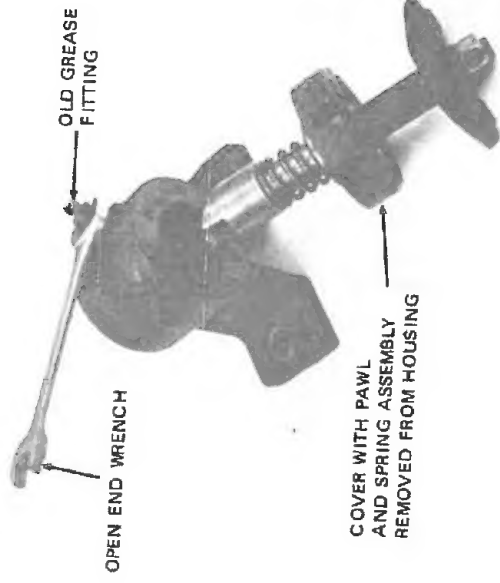


FIGURE 2

6. Reassemble cover with pawl and spring assembly to housing. Refer to back of page MMG 3010.0.

7. Lubricate driving and holding pawl assemblies as per instructions in lubrication chart.

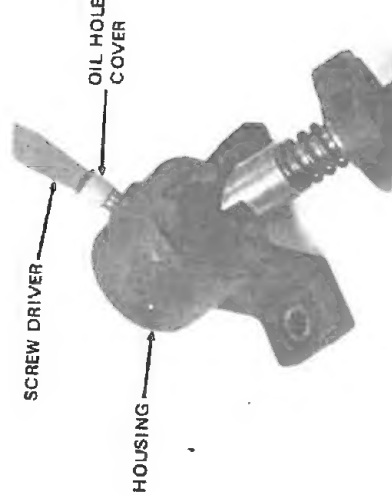


FIGURE 3

## SERVICE PROCEDURE

Semi-yearly remove cover with pawl and spring assembly from housing, and rinse in kerosene or diesel fuel and wipe clean. Also, clean inside of housing with kerosene or diesel fuel and wipe clean. Re-assemble cover with pawl and spring assembly back into housing and lubricate.